

IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1 1. (currently amended) An impeller for pumping
2 molten metal including a body having a longitudinal
3 axis, an end surface transversely intersecting said
4 axis, a peripheral surface extending about said axis,
5 and a plurality of elongate pumping chambers extending
6 in said body at angularly spaced locations about said
7 longitudinal axis, said impeller having a direction of
8 rotation in which it is adapted to be driven, each of
9 said pumping chambers having a length extending along
10 said peripheral surface and a width extending
11 transverse to said length, said pumping chamber having
12 an inlet opening formed in said end surface and an
13 outlet opening formed in said peripheral surface at an
14 angle inclined into said direction of rotation, said
15 pumping chamber also including opposed planar walls of
16 substantially equal length extending to said outlet
17 opening, said pumping chamber length and width being in
18 a ratio of less than 3:1.

1 2. (original) An impeller as in claim 1, wherein
2 said ratio is from less than 3:1 to 1:1 or less.

1 3. (currently amended) An impeller as a claim 1,
2 wherein ~~said impeller has a direction of rotation in~~
3 ~~which it is adapted to be driven and said pumping~~
4 ~~chamber includes a chamber surface that extends at an~~
5 ~~angle inclined into said direction of rotation whereby~~
6 ~~said chamber surface provides axial pumping~~ one of said
7 chamber walls providing a trailing chamber surface for
8 axially pumping molten metal into said chamber upon
9 rotation of said impeller.

1 4. (original) An impeller as in claim 1, wherein
2 said outlet opening extends along substantially the
3 entire length of said pumping chamber.

1 5. (original) An impeller as in claim 4, wherein
2 said body has a longitudinal dimension and said pumping
3 chamber length extends along 10 to 100% of said
4 longitudinal dimension of said body.

1 6. (currently amended) An impeller as in claim 5,
2 wherein said pumping chamber ~~length extends along 20 to~~
3 ~~85% of said longitudinal dimension of said body~~ has a
4 generally rectangular cross-section wherein said outlet
5 opening extends along an open side of the rectangle.

6 7. (original) An impeller as in claim 1, wherein
7 said body has a radial dimension and said pumping
8 chamber is located substantially entirely in the
9 radially outermost 1/3 of said radial dimension of said
10 body.

1 8. (original) An impeller as in claim 4, wherein
2 at least one communicating bore extends through said
3 body connecting said pumping chambers.

1 9. (original) An impeller as in claim 4, wherein
2 a plurality of communicating bores extend through said
3 body connecting said pumping chambers.

1 10. (original) An impeller as in claim 4, wherein
2 at least one bore extends from said pumping chamber
3 through said body to a surface of said body remote of
4 said end surface and said peripheral surface.

1 11. (original) An impeller as in claim 10,
2 wherein said body includes a second end surface axially
3 spaced from said first mentioned end surface and a
4 shaft opening including a shaft receiving surface, and
5 said remote surface is one of said second end surface
6 and said shaft receiving surface.

1 12. (original) An impeller as in claim 4, wherein
2 said body has a cylindrical shape including a first
3 radial end forming said end surface, a second radial
4 end forming an opposed second end surface and a
5 cylindrical surface extending between said first and
6 second radial ends forming said peripheral surface.

1 13. (original) An impeller as in claim 4, wherein
2 at least one bore extends from at least one of said
3 pumping chambers through said body to a surface of said
4 body remote of said end surface and said peripheral
5 surface.

1 14. (original) An impeller as in claim 12,
2 wherein a plurality of communicating bores extend
3 through said body connecting said pumping chambers.

1 15. (original) An impeller as in claim 4, wherein
2 said pumping chamber length extends along said
3 peripheral surface at an angle with respect to said
4 longitudinal axis.

1 16. (original) An impeller as in claim 15,
2 wherein said impeller has a direction of rotation in

3 which it is adapted to be rotatably driven and said
4 angle is inclined into said direction of rotation.

1 17. (original) An impeller as in claim 16,
2 wherein said angle is between 0 and 45 degrees.

1 18. (original) An impeller as in claim 16,
2 wherein said pumping chamber length extends in a linear
3 direction.

1 19. (currently amended) A molten metal pump
2 comprising an elongated shaft having a first end
3 connected to a driving means and a second end connected
4 to an impeller to be driven in a direction of rotation
5 to pump molten metal, said impeller being disposed in a
6 pump housing having a housing inlet through which
7 molten metal may be drawn and a housing outlet through
8 which molten metal may be discharged, said impeller
9 including a body having a longitudinal axis, an end
10 surface transversely intersecting said axis, a
11 peripheral surface extending about said axis, and a
12 plurality of elongate pumping chambers extending in
13 said body at angularly spaced locations about said
14 longitudinal axis, each of said pumping chambers having
15 a length extending along said peripheral surface and a

16 width extending transverse to said length, said pumping
17 chamber having an inlet opening formed in said end
18 surface and an outlet opening formed in said peripheral
19 surface, said pumping chamber having opposed flat walls
20 of substantially equal length extending to said outlet
21 opening at an angle inclined into said direction of
22 rotation, said pumping chamber length and width being
23 in a ratio of less than 3:1.

1 20. (currently amended) A pump as set forth in
2 claim 19, wherein said pumping chambers are located in
3 ~~ten~~ the outermost 1/3 of said body.

1 21. (new) A pump as set forth in claim 19,
2 wherein said outlet opening and said flat walls extend
3 along substantially the entire axial length of said
4 pumping chamber.

1 22. A pump as set forth in claim 21, wherein said
2 pumping chamber extends along substantially all of the
3 longitudinal extent of said body.